



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,640	07/26/2001	Hidemasa Yamaguchi	09792909-5089	6476

26263 7590 09/02/2003

SONNENSCHN NATH & ROSENTHAL LLP  
P.O. BOX 061080  
WACKER DRIVE STATION, SEARS TOWER  
CHICAGO, IL 60606-1080

EXAMINER
----------

CHOWDHURY, TARIFUR RASHID

ART UNIT	PAPER NUMBER
----------	--------------

2871

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/915,640

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Tarifur R Chowdhury

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. **Claims 1, 2-5, 8, 9, 19, 23, 26 and 27 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wu et al., (Wu), US 2002/0063832.**

4. discloses and shows in Figs. 4(a) and 4(b), a liquid crystal display device of a multi-domain vertical alignment mode (page 2, paragraph 0035), comprising:

- a driving substrate (41) having a pixel electrode (42);
- a counter substrate (40) opposing the driving substrate and having a counter electrode (43) ; and

- a liquid crystal sandwiched between the substrates,

wherein molecules (45) of the liquid crystal are aligned nearly perpendicular to the substrates when no electric field is produced (Fig. 4(a)), and are aligned nearly horizontally by the application of a predetermined voltage (Fig. 4(b)),

Wherein the counter substrate (40) has an alignment center portion (44) for orienting the molecules (45) of the liquid crystal in all directions centered on a certain point when the voltage is applied (Fig. 4(b)), and

Wherein the alignment center portion (44) of the counter substrate has a base area that is less than or equal to 5% of the area of one pixel (Figs. 4(a) and 4(b)).

Even arguing that Miyachi does not explicitly disclose that the area of the alignment center portion of the driving substrate is set to be less than or equal to 5% of an area of one pixel, it would have been obvious to one of ordinary skill in the art to set the area at a desirable percentage because if the area occupied by the alignment center portion is excessively large then the light transmittance of the LCD device is excessively reduced and on the other hand when the area is too small the multi-domain effect is minimal and thus the viewing angle is reduced.

Accordingly, claims 1, 2, 8, 19 and 26 would have been obvious.

As to claims 3 and 4, setting the base area of the protuberances within the claimed range is within the level of ordinary skill in the art and thus would have been obvious to optimize device performance.

As to claims 5 and 23, Wu also shows in Fig. 4(a) that the pixel electrode (42) has a slit for making multi-domain alignment of the liquid crystal nearly vertically or horizontally symmetric.

As to claims 9 and 27, setting the pixel pitch less than or equal to 70 micro meter is common and known in the art and thus would have been obvious to optimize device performance.

**5. Claims 6, 7, 10-18, 20-22, 24, 25, and 27-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu as applied to claims 1, 2-5, 8, 9, 19, 23, 26 and 27 above and in view of Miyachi et al., (Miyachi), USPAT 6,384,889.**

6. Wu differs from the claimed invention because he does not explicitly disclose the claimed chiral material, chiral pitch and the relationship.

Miyachi discloses a vertically alignment type multi-domain liquid crystal display. Miyachi also discloses that by adding a chiral dopant in the liquid crystal material, the liquid crystal molecule have a twist angle of about 90 degrees, i.e., a spiral pitch about four times the cell thickness, it is possible to optimize light utilization ratio and the color balance of the display (col. 22, lines 10-22).

Miyachi is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use chiral material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of Wu such that adding a chiral dopant so that the relationship is met so that light utilization ratio and color balance is optimized, as per the teachings of Miyachi.

Accordingly, claims 6,7, 24 and 25 would have been obvious.

As to claims 10, 11-18, 20, 27-36, Wu differs from the claimed invention because he does not explicitly disclose the claimed retardation film.

Miyachi discloses and shows in Fig. 24A, a retardation film (604a) having refractive indices of  $N_x$ ,  $N_y$  and  $N_z$ , is placed between a polarizer (602a) and the counter substrate or the driving substrate and that the viewing angle characteristic of the LCD device is improved by setting a retardation of the retardation film to be about 0.5 to 1.5 (overlaps the claimed range) of a retardation of the liquid crystal layer (col. 23, lines 11-26).

Miyachi is evidence that ordinary workers in the art would find a reason, suggestion or motivation use a retardation film that meets the claimed conditions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of Wu by employing a retardation film that meets the claimed condition so that viewing angle characteristics of the display device is improved, as per the teachings of Miyachi.

As to claims 20 and 22, typically alignment disturbing surfaces are formed as alignment center portion by applying UV light, as evidenced by Miyachi (col. 20, lines 27-28) and thus would have been obvious to avail proven techniques.

As to claims 3, 4 and 21, setting the base area of the protuberances within the claimed range is within the level of ordinary skill in the art and thus would have been obvious to optimize device performance.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (703) 308-4115. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7005 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

T. Chowdhury  
Primary Examiner  
Technology Center 2800

TRC  
August 27, 2003